

Monitoring Study Group Meeting Minutes

November 10, 2004

Mendocino County Museum, Willits

The following people attended the MSG meeting: Tharon O'Dell (BOF-chair), Teri Jo Barber (Ridge to River/MCRCD), Tom Spittler (CGS), John Munn (CDF), Ryan McKillop (Soper-Wheeler Co.), Steve Auten (Big Creek Lumber Co.), Dennis Slota (Mendocino Co. Water Agency), Dr. Richard Harris (UCB), Jared Gerstein (UCB), Dr. Cajun James (SPI), Julie Bawcom (CGS), Kirk Vodopals (MRC), Jonathan Warmerdam (NCRWQCB), Matthew House (Green Diamond Resource Co.), Curt Babcock (DFG), Joe Croteau (DFG), Richard Gienger (HWC/SSRC), Brad Valentine (DFG), Robert Horvat (CDF-JDSF), Dr. Bill Weaver (PWA), Kevin Faucher (CTM), Peter Ribar (CTM), Dennis Hall (CDF), Angela Wilson (CVRWQCB), Shane Cunningham (CDF), and Pete Cafferata (CDF).

[Note: action items are shown in bold print].

We began the meeting with general monitoring related announcements:

- John Munn announced that the MOU Monitoring Workgroup, made up of state agency representatives, including the Regional Water Quality Control Boards, SWRCB, CGS, and CDF, has nearly completed work on developing mutually acceptable criteria for different types of water quality monitoring at the THP scale. The Workgroup has been able to reach final agreement on: (1) shared agency goals, (2) water quality monitoring authorities, and (3) conditions and objectives for water quality monitoring. The Workgroup is continuing to work on the implementation section of the final report, with completion of the project expected in early December.
- Pete Cafferata restated that the Watershed Management Council's 10th Biennial Meeting will be held from November 15-19th in San Diego. The conference is titled: "Watershed Management on the Edge—Scarcity, Quantity, and Distribution." Many concurrent sessions are planned and Dr. George Ice of NCASI is chairing one session on fire impacts. Tom Spittler and Dr. Sue Cannon (USGS) will present papers on post-fire erosion. A final agenda for the conference is available at: <http://www.watershed.org/wmc/index.php>
- Pete Cafferata reminded the group that the Monitoring Study Group webpage now has all the past MSG meeting minutes posted for years 2002, 2003, and 2004 under "General Information"—see http://www.bof.fire.ca.gov/board/msg_geninfo.html. Additionally, past MSG reports and MSG supported reports are posted at http://www.bof.fire.ca.gov/board/msg_supportedreports.html and MSG archived documents are posted at: http://www.bof.fire.ca.gov/board/msg_archives.html

Following these announcements, Ms. Teri Jo Barber, representing the Mendocino County Resource Conservation District, provided a PowerPoint update on the Garcia River Cooperative Instream Monitoring Program. This project has been ongoing since 1998, when Dr. Fred Euphrat and others prepared a watershed assessment and instream monitoring plan for the Garcia River basin. Baseline monitoring data was collected in 12

sub-watersheds during 1998-1999 and a final report was written by Michael Maahs and Teri Jo in 2001 (http://www.bof.fire.ca.gov/pdfs/Garcia_River_Instream.pdf).

A new phase of the of the Garcia instream monitoring project was started in 2003, with funding from the NCRWQCB and CDF. The 2003-2005 phase is focusing on a subset of the original 12 sub-watersheds to determine if sediment and turbidity conditions are improving for anadromous salmonids.¹ Water quality parameters that are sensitive to sediment movement and impact salmonid habitat have been selected. Bulk instream gravel composition and permeability were measured in 1998/1999 and are being remeasured in this 303(d) listed TMDL watershed, allowing trend monitoring to occur. Embeddedness has been added in this new phase of the project, as has continuous turbidity measurement to locate sediment sources and determine both the total and consecutive days turbidity is sustained over biologically related turbidity thresholds (see the North Coast Regional Water Quality Control Board contract specifications/study plan at: http://www.bof.fire.ca.gov/board/garcia_final_comments.pdf).² Upslope road rehabilitation work is occurring in some of the selected sub-basins and monitoring in this phase of the project will attempt to determine a water quality response. Teri Jo stressed that obtaining landowner permission for access has been difficult at times and remains an important issue for this project, and that available funding has limited monitoring efforts in the watershed.

Continuous recording turbidity monitoring stations were operated during the winter of 2003-2004 in the mainstem of the Garcia, and the South Fork, Mill Creek, Pardaloe Creek, and Whitlow Creek tributaries. Due to the difficulty of maintaining equipment in a large stream, the mainstem station is being replaced for 2004-2005 with a new continuous recording turbidity station on Inman Creek, located in the central part of the basin. A road-based erosion control restoration plan is being developed by the new landowner in Inman Creek, and pre-project data collection will occur this winter. Turbidity data collected last winter showed that values up to approximately 2000 NTUs were recorded at four of the stations (including the mainstem), while maximum readings at one station were about 800 NTUs where past road improvement work had occurred. Due to the lack of pre-project data collection, it is unknown if the road work is related to lower turbidity data values. In general, spikes in turbidity at all the stations appear to be brief (i.e., “flashy” response). Teri Jo is currently coding the raw turbidity data where malfunctions are suspected and is correcting the data using standard protocols. Several plots of turbidity vs. stage were displayed and discussed. Discharge has not been determined. Turbidity response will be related to past logging and roading, as recorded in GIS maps/databases produced by CDF’s Suzanne Lang in Santa Rosa. Additionally, an ISCO pumping sampler will be installed at the Mill Creek station this winter to relate suspended sediment concentration to turbidity.

¹ The 12 tributaries included Whitlow, Mill, Pardaloe, and Inman Creeks, and the South Fork Garcia River.

² See “Fish Habitat in Freshwater Streams” by Thompson and Larsen, Univ. of Calif. Div. of Agriculture and Natural Resources Publ. 8112 for turbidity limits related to different life stage functions (<http://anrcatalog.ucdavis.edu/pdf/8112.pdf>).

Spawning gravel quality was remeasured during the summer of 2004 at the Mill, Pardaloe, Whitlow, and South Fork stations. Bulk gravel particle size composition was determined with a 12 inch cylinder inserted into spawnable gravel. Approximately one 5-gallon bucket of gravel was obtained per station, with 8 stations per tributary. Samples will be dry sieved to determine particle size composition by Graham Matthews and Associates in Arcata. Embeddedness was also determined at these sites. Permeability was remeasured at the Mill, Pardaloe, South Fork, and Inman tributaries, with 8 stations per tributary. Permeability was found to vary from roughly 5 cm in 2 seconds to about 5 cm in 30 seconds. Measurements were made by one person to save limited funds, and the data has been sent to McBain and Trush for analysis. **Further updates on this project will be provided to the MSG in the future.**

Next, Dr. Richard Harris provided the MSG with a presentation on a new study being developed titled "The Effects of Stream Crossing Upgrading on Sediment Delivery and Water Quality." Richard stated that this project is a direct outgrowth of work completed by UCCE for DFG to monitor fish habitat restoration projects. A study proposal will be submitted to the University of California on November 15th for a maximum funding amount of \$35,000, and Richard and Jared Gerstein are actively looking for potential collaborators for this study. UC funding would not begin before March 1, 2005. The project has been designed to address growing concerns from regulating agencies over the magnitude and duration of short-term water quality impacts associated with upgrading watercourse crossings (i.e., "construction sites"). The basic premise of the project is to combine abundant data from multiple cooperators and determine the range of impacts. UC's main tasks will be to: develop the study plan, identify study sites, collect data (where the landowner is not able to), provide training, manage data collected (including laboratory tests), analyze and interpret data, and disseminate results. The goal is to produce recommendations to improve crossing upgrade work.

The main types of data to be collected are turbidity above and below crossings, channel dimensions above and below crossings, erosion and sediment delivery from the road prism and fill slopes, and site characteristics (as potential explanatory variables). Erosion and sediment delivery voids and channel dimensions above and below crossings can be determined at the end of the season, while turbidity above and below the crossing must be made during storm events. Only road upgrade work will be considered—not crossing abandonment or decommissioning. Immediate construction impacts and the short-term channel post-adjustments will be documented. To limit sediment contribution through inside ditches (hydrologic connectivity), it is likely that no more than 100 feet of ditchline will be allowed for a crossing to be studied. Examples of data previously collected at a Hopland Field Station site were displayed. The proposal initially covers two years, with possible extensions in the future.

A meeting in Eureka on November 15th was held to discuss the project in detail with potential collaborators. John Munn stressed that the study plan should be reviewed for statistical validity. Cajun James noted that the study will likely document variation in operator skill, since this is a large factor in how well new pipes are installed in stream channels. She also stated that relatively simple, repeatable approaches are required.

Richard stated that there are examples of past UC studies that have relied upon collaborators for data input, such as the CACTOS/CRYPTOS timber output simulators. **Updates on the project will be provided to the MSG in future months.**

Following lunch, Dr. Cajun James led a discussion on the draft study plan she developed for the Judd Creek Cooperative Instream Monitoring Project in Tehama County (see: http://www.bof.fire.ca.gov/pdfs/Judd%20Creek%20Final_Prospectus_MSG_maps.pdf). Cajun stated that unlike the Wages Creek and Garcia River cooperative instream monitoring projects, her project has a nearly approved THP in place specifying planned logging units and road construction/upgrading/abandonment work. Additionally, unlike the North Coast studies, Judd Creek has a significant runoff component from snowmelt.

The Judd Creek watershed covers approximately 6,350 acres and is a tributary of the North Fork of Antelope Creek, which drains into the Sacramento River near Red Bluff. Bedrock is of volcanic origin. SPI owns 72% of the basin, with remainder owned by the USFS (12%) and a private rancher (16%). The “Engebretsen” THP proposes 41 clearcut units covering 816 acres. This type of THP is typical of current SPI plans. The five phases of the project beginning in the winter of 2004 through the winter of 2010 were described.

Significant baseline data for this watershed already exists due to previous studies completed in the basin, including Cajun’s doctoral dissertation on riparian buffer strip impacts, macroinvertebrate studies, large wood and sediment budget studies, and hillslope erosion measurement associated with clearcut logging units. Roughly four years of continuous YSI Sonde data for turbidity and stage are available, as well as one year of suspended sediment measurement to quantify some baseline relationships on Judd Creek.

The objective of the new cooperative instream study is to examine the response of water quality in Judd Creek to intensive forest management activities. The main hypothesis to be tested is whether the contribution to total suspended sediment from logging operations (denoted as “LSS” in a 3 page handout provided) is statistically significant or has any practical effect. Changes in the spatial and temporal variability of stream flow, turbidity, and suspended sediment regimes will be characterized before and after timber harvest operations to determine their impact on water quality. Data will be collected from five monitoring stations along Judd Creek—one above a large privately owned meadow area and four below the meadow. Approximately half the clearcut units flow into the area above the meadow and half into the area below the meadow. Situating stations above and below the meadow will allow the impacts to the two areas to be isolated.

Cajun stated that it will likely be difficult to isolate the suspended sediment signal related to current logging operations for Judd Creek due to BMPs employed and the “noise” in the system from past road problems. She also stressed that it is unrealistic to expect to determine what “background” sediment levels are for the baseline with only a few years of pre-treatment data. Rather than applying more traditional techniques (i.e., paired watersheds, baseline vs. post logging, BACI design), she is interested in applying a data normalizing technique for stream flow events that has been recently employed by Dr. James Kirchner of UC Berkeley (denoted as “comparison of temporal upstream and downstream suspended sediment loading differences”). To illustrate this process for

dealing with episodic data, she provided MSG participants with a paper authored by Dyan Whyte of the San Francisco Bay Area RWQCB and Dr. Kirchner (see: http://www.seismo.berkeley.edu/~kirchner/reprints/2000_35_Whyte_mercury.pdf) This approach involves modeling temporal suspended sediment pulses through the logging area. Baseline modeling relationships can be used to quantify pulse behavior prior to logging activities. The pulse model can be expanded to include logging variables after logging occurs and differences due to logging are inferred.

Curt Babcock, Angela Wilson, and Brad Valentine informed Cajun that they believe that the stated hypothesis is unobtainable due to the abundance of stored sediment in the channel for 1.5 miles above the meadow, the actively eroding channel banks present (i.e., legacy impacts), and the likelihood of sediment storage on the meadow due to complete channel diversion. They stated that logging impacts will not be able to be detected due to the existing conditions prior to logging in this system. Curt suggested that a station further up in the watershed is needed to have a “above and below” experiment. Cajun responded that there is insufficient streamflow much higher in the watershed and access during winter snow storms would be limiting. She also stated that this type of experimental design would allow her to determine if the logging impacts were huge and the Kirchner data transformation for data analysis would help address this issue. **Tom Spittler stressed that for this study, it is imperative to: (1) document the limits that can be determined with this experimental design, and (2) state the assumptions of the project clearly.** Dr. James agreed to do complete these items for this project. Cajun is currently refining the Judd Creek project following the input received at this meeting and requests that further input be sent to her by email (cjames@spi-ind.com). Additionally, she is attempting to schedule a second workshop on water quality monitoring in association with UC and CDF for March 2005 in Redding.

Following Dr. James presentation, Kevin Faucher and Peter Ribar of Campbell Timberland Management provided a brief update on the Wages Creek Cooperative Instream Monitoring Project located in western Mendocino County. **A new version of the Wages Creek Study Plan (ver. 2.0) was handed out and is now posted on the MSG website at: http://www.bof.fire.ca.gov/pdfs/SFWages_EffectivenessProposal_Nov2004.pdf.** Kevin has reinstalled the instrumentation at the four automated stations monitored last winter and data is again being collected. Some modifications have been made to allow improved data collection at these sites. It is anticipated that a new station will be established in the lower part of the Wages Creek watershed this winter at a bridged site, but final permission from the landowner has yet to be received. New equipment for this station has been purchased by CDF and it being sent to Fort Bragg as it arrives in Sacramento.

Pete Cafferata gave a brief update on CDF's planned “Interagency Mitigation Monitoring Program,” which will build on what has been learned in the Hillslope Monitoring Program and Modified Completion Report monitoring work. At the last MSG meeting held in September, 13 bullet points were presented to open a dialogue on this new multi-agency hillslope monitoring effort. Some detailed comments were received and a new 2 page draft document describing a possible approach was handed out at this meeting.

Briefly, CDF Audit Foresters would coordinate audits with designated interagency monitoring teams in each region (Coast, Northern, and Southern). Representatives from the appropriate Water Boards, DFG, and CGS would be requested to assist with field monitoring efforts. A randomly selected sample of THPs in Threatened and Impaired Watersheds and in 303(d) listed watersheds for sediment would be monitored, with screening criteria used to ensure that the plans contain sufficient features of interest. The resulting random sample of qualifying plans would be stratified by region, assuming approximately 45% of THPs are in Coast District, 40% in Northern District, and 15% in the Southern District, out of a total of 550 to 600 THPs received per year. Items to monitor/assess would be determined in cooperation with the Review Team agencies, but are anticipated to be as quantitative in nature as possible. Monitoring would be completed during the three year Erosion Control Maintenance Period (ECMP). Plans that do not experience a large stressing storm event in the first two years of the ECMP would be evaluated during the last year of the ECMP for a differing set of parameters related to chronic erosion.

Dennis Hall stressed that: (1) CDF is very serious in getting this new program functioning, since CDF has now re-staffed its Audit Forester positions in Santa Rosa, Fresno, and Redding, and (2) whatever approaches are developed must be repeatable so that if other Review Team agency personnel are not present in the field, the results of the monitoring will be trusted and verifiable. **Mr. O'Dell asked that Monitoring Study Group participants read the 2 page handout and provide comments to Pete Cafferata (pete.cafferata@fire.ca.gov), and that an MSG subcommittee be established at the next meeting to move forward with the new program.**

During the public comment agenda item, Mr. Gienger restated that he believes it would be beneficial for the MSG to have a winter field trip to observe field conditions at watercourse crossings during the more hydrologically active part of the year. He also suggested that the strategies adopted by the Fish and Game Commission for the coho recovery effort calling for an RPF to inspect/monitor the entire THP prior to the Work Completion Report inspection to locate areas requiring further work to reduce plan impacts should be implemented. Mr. Ribar replied that this is already happening through the new Water Board General Waste Discharge Requirement (GWDR) process.

The next MSG meeting was scheduled for February 2, 2005 at 10:00 a.m. in Redding. The exact location is still to be determined and will be emailed to the MSG when it is available, along with an agenda for the meeting.